Unresolved references to MPI routines ...

oloso 6 posts since

Aug 16, 2007 Derek,

MPICH is made part of baselibs precisely for a situation like yours, that is, using baselibs on a platform that doesn't have any native MPI library. Unfortunately, the MPICH version packaged with baselibs is very old and has not been updated for a while. I suspect the error that you are getting is because the interfaces expected by ESMF for the indicated MPI routines is different from the ones in the old MPICH. So my recommendation will be to use a more recent version of MPICH. Also, make sure that you set the environmental variable ESMF_COMM to mpich before you build baselibs (primarily for ESMF) so that ESMF will know to use the right interface.

-Hamid

From: Derek Posselt

Date: April 10, 2008 11:32:13 PM EDT

To: "Clune, Thomas L. (GSFC-610.3)"

Cc: Carlos Cruz

Subject: Update

Hi Tom and Carlos,

I think I'm making progress, but I'm running into errors that I'm having trouble diagnosing. The errors come in the compilation of time_ave.x while compiling in GMAO_Shared/GEOS_Util/post:

/home/dposselt/Numerical_Models/GEOS5/GEOS5_Source/baselibs/Linux/lib/libesmf.a(ESMC_VMKernel.o): In function `ESMC_VMK::vmk_finalize()':

/home/dposselt/Numerical_Models/GEOS5/GEOS5_Source/baselibs/src/esmf/src/Infrastructure/VM/src/ESMC_VMKernel.C:(.text+0x3c): undefined reference to `MPI_Finalized'

These come in concert with other undefined reference errors regarding MPI functions. I checked to make sure the baselib that contains the mpi libraries was being included, and added every libmpich* I could find to the compilation to no avail. I have posted the new install.log file and ESMA_arch.mk files to:

http://www-personal.umich.edu/~dposselt/GEOS5/

Note that I have modified the Intel Fortran Compiler section in ESMA_arch.mk.

In other news, I took a crack at skipping compilation in the GMAO_Shared directory and moving on to GEOSgcs_GridComp and Applications, and this is producing a few errors as well (see file install1.log on the aforementioned website). Some are of the form:

gmake[6]: Entering directory `/home/dposselt/Numerical_Models/GEOS5/GEOS5_Source/GEOSgcm/src/GEOSgcs_GridComp/GEOSgcm_GridComp/GEOSagcm_GridComp/GEOSphysics_GridComp/GEOSchem_GridComp/GMIchem_GridComp'

<stdin>:1:26: error: MAPL_Generic.h: No such file or directory

gmake[6]: [GMIchem_GridCompMod.d] Error 1 (ignored)

while others are:

Building dependency file Aero_GridCompMod.d

<stdin>:479:37: error: DU_ExportSpec___.h: No such file or directory

<stdin>:483:37: error: SS_ExportSpec___.h: No such file or directory

<stdin>:487:37: error: SU_ExportSpec___.h: No such file or directory

<stdin>:491:37: error: BC_ExportSpec___.h: No such file or directory

<stdin>:495:37: error: OC_ExportSpec___.h: No such file or directory

<stdin>:499:37: error: CO_ExportSpec___.h: No such file or directory

<stdin>:503:38: error: CO2_ExportSpec___.h: No such file or directory

gmake[6]: [GOCART_GridCompMod.d] Error 1 (ignored)

and finally when compiling the GCM executable itself:

/opt/intel/fce/9.1.052/lib/libifcore.a(for_getarg.o): In function `getarg_':

./src/libfor/for_getarg.c:(.text+0x1ac): multiple definition of `getarg_'

/usr/lib/gcc/x86_64-redhat-linux/3.4.6/libg2c.a(Lgetarg.o):(.text+0x0): first defined here

ld: Warning: size of symbol `getarg_' changed from 5 in /usr/lib/gcc/x86_64-redhat-linux/3.4.6/libg2c.a(Lgetarg.o) to 140 in /opt/intel/fce/9.1.052/lib/libifcore.a(for_getarg.o)

gmake[2]: *** [GEOSgcm.x] Error 1

gmake[2]: Leaving directory `/home/dposselt/Numerical_Models/GEOS5/GEOS5_Source/GEOSgcm/src/Applications/GEOSgcm_App'

Ideas?

Thanks,

--Derek

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Tags: unresolved_references, mpi, baselibs, esmf

dposselt *11 posts since Apr 11, 2008*

1. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 11, 2008 2:08 PM

Hamid,

I could certainly use a more recent version of MPICH--I have compiled mpich-1.2.7p1 (the latest version of MPICH 1) locally. Can you tell me how to make sure my precompiled MPICH is encorporated into the ESMF compilation within baselibs? I would guess that the first step is to set MPICH_COND=no in the baselibs configure script, but how do I tell the baselibs compilation where to find my mpich distribution (currently in /usr/local/mpich)?

Thanks,

--Derek

dposselt *11 posts since*
Apr 11, 2008 2. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 11, 2008 2:08 PM

Status update: I compiled baselibs without the old mpich libraries and linking in my own (newer) precompiled mpich-1.2.7p1 libraries. This went fine, but I am still getting the same errors I mentioned in my previous email when I try to compile GEOS5 itself.

oloso *6 posts since*
Aug 16, 2007 3. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 11, 2008 3:04 PM

in response to: dposselt Derek,

Yes, set MPICH_COND=no. Make sure ESMF_COMM env variable is set to mpich. Other than this you don't need to do anything else, I believe. Of course ensure that /usr/local/mpich/bin is added to your PATH and /usr/local/mpich/lib to your LIBRARY_PATH and LD_LIBRARY_PATH (if you have any shared ".so" libraries in your MPICH build).

Please give it a shot and let us know.

-Hamid

dposselt *11 posts since*
Apr 11, 2008 4. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 13, 2008 11:08 AM

in response to: oloso

Hamid,

I followed your suggestion, and recompiled baselibs with ESMF_COMM=mpich, and this looked to work just fine (no error messages). I am, however, still getting the undefined reference errors to MPI functions in the compilation of the post utils. The good news is that when I first compile GEOSgcm (proceeds until the MPI errors), then modify the makefile to exclude compilation in the GMAO_Shared directory, everything else (including the model executable) appears to compile without warnings. I have posted new ESMA_arch.mk and install.log files to:

http://www-personal.umich.edu/~dposselt/GEOS5/

rsyed *27 posts since*
Oct 18, 2007 5. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 14, 2008 10:19 AM

in response to: dposselt Derek,

Could you post the output of this?

cd /usr/local/mpich/lib/

nm libmpich.a | grep -i MPI_Finalize

Also please make sure there are no libmpich* files in
/home/dposselt/Numerical_Models/GEOS5/GEOS5_Source/baselibs/Linux/lib

Could you also post the output of echo $LD_LIBRARY_PATH please?

dposselt *11 posts since*
Apr 11, 2008 6. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 14, 2008 11:53 AM

in response to: rsyed [dposselt@tyr ~]$ cd /usr/local/mpich/lib/ [dposselt@tyr lib]$ nm libmpich.a | grep MPI_Finalize 0000000000000000 W MPI_Finalize 0000000000000000 T PMPI_Finalize 0000000000000000 W MPI_Finalized 0000000000000000 T PMPI_Finalized U MPI_Finalized U MPI_Finalize [dposselt@tyr lib]$ ls /home/dposselt/Numerical_Models/GEOS5/GEOS5_Source/baselibs/Linux/lib/*mpich* ls: /home/dposselt/Numerical_Models/GEOS5/GEOS5_Source/baselibs/Linux/lib/*mpich*: No such file or directory [dposselt@tyr lib]$ echo $LD_LIBRARY_PATH :/lib:/lib:/linux86-64/7.0/lib:/lib:/opt/intel/fce/9.1.052/lib:/opt/intel/cce/9.1.052/lib:/opt/pgi/linux86-64/7.0-6/lib:/usr/local/mpich/lib:/opt/intel/mkl/9.0/lib/32

rsyed *27 posts since*
Oct 18, 2007 7. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 15, 2008 4:04 PM

in response to: dposselt Hm, unfortunately that all looks correct. Could you try modifying the build script so that instead of providing the -L and -l flags for mpich libs, you provide the libs explicitly? For example:

instead of:

-L/usr/local/mpich/lib -lmpich

provide the argument:

/usr/local/mpich/lib/libmpich.a

We're not quite sure why you're having this problem, perhaps it's an environmental difference between your system and ours. We'll investigate further, depending on how it goes with this suggestion.

dposselt *11 posts since*
Apr 11, 2008 8. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 15, 2008 11:09 PM

in response to: rsyed I made the change you suggested--here is line 313 in Config/ESMA_arch.mk:

LIB_MPI = /usr/local/mpich/lib/libmpich.a /usr/local/mpich/lib/libpmpich++.a

Unfortunately, this did not solve the problem, and I'm still getting the same "undefined reference" errors... I took a closer look at the errors, and it looks like all are associated with a single file:

~baselibs/src/esmf/src/Infrastructure/VM/src/ESMC_VMKernel.C

I am currently trying to make sure the MPI libraries are being properly linked in when this file is being compiled--will keep you posted.

Edit: I tried making sure the MPI libraries were being linked in by setting

export MPI_HOME=/usr/local/mpich

but this did not fix the problem...

clune *113 posts since*

May 31, 2007 9. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 16, 2008 8:19 AM

in response to: dposselt Hi Derek,

At the risk of suggesting something that has already been tried ... Have you tried just building a simple Fortran MPI program to verify that you can link something simpler. Some builds of MPI require links to multiple layers of MPI libraries, and the GEOS build may not be reflecting it due to the streamlined MPI we have on the cluster. Something like -lfmpi -lmpi (or the reverse) might be necessary.

Cheers,

- Tom

dposselt *11 posts since*
Apr 11, 2008 10. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 16, 2008 5:03 PM

in response to: clune

Hi Tom,

I'm working on this now--trying to compile WRF with the same combination of compilers as I'm using for the GEOS-5 and do a test run--I'll let you know how this goes. I've successfully run WRF (and the Goddard Cumulus Ensemble model) in MPI mode on this machine in the past, but not with this particular combination of compilers...

--Derek

dposselt *11 posts since*
Apr 11, 2008 11. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 17, 2008 1:43 PM

in response to: dposselt

Tom,

I'm still working on trying to get the WRF to run witn Intel compilers on my machine (for some reason, I'm getting segfaults...), but I have been able to run the Goddard Cumulus Ensemble model with 132x66 gridpoints compiled with ifort version 9.1.052. This tells me that MPI is working on this machine...

clune *113 posts since*
May 31, 2007 12. **Re: Unresolved references to MPI routines from ESMF in baselibs** Apr 17, 2008 2:09 PM

in response to: dposselt Hi Derek,

Actually you've gone well past the point that my advice was aimed at. I was only concern about the link errors you were seeing. I don't have any reason to suspect MPI for the runtime errors you are seeing (in any of the models). Well, maybe a slight reason in that it is one of the more obvious diffenences in the runs at your end vs ours, but it is very slight.

Cheers,

- Tom